

ABSTRACT

A method and corresponding equipment by which a synthesizer/
MIDI (musical instrument digital interface) device (10) is
able to optimally perform a MIDI file (11) taking into account
not the polyphony required by the MIDI file (11) as in SP-MIDI
(scalable polyphony MIDI), but taking into account instead
extended scalable polyphony (XSP) data 12b including the
maximum number of instantaneous voices required by the MIDI
file and the categories in which they occur for different
channel masking, and also taking into account the architecture
of the synthesizer/ MIDI device (10) in terms of a voice
complexity coefficient table (12b) indicating the relative
complexity (corresponding to a resource requirement) for
voices in each category. The result is a total voice
requirement table 12c-1 indicating typically less masking than
would be required for the same synthesizer/ MIDI device to
play the MIDI file according to SP-MIDI.

Appendix

Algorithm for the calculation of the total voice requirements based on MIV and corresponding classification data provided with a MIDI file. The code block for `mip_length != miv_length` allows backward compatibility with SP-MIDI; if MIV data is not provided with the MIDI file, then the algorithm mutes channels exactly as in SP-MIDI.

Inputs

`polyphony:` The maximum number of Notes the player can play simultaneously
`max_capacity:` The maximum processing capacity of voices
`mip_length:` The number of entries in the MIP table
`miv_length:` The number of entries in the MIV table
`cla_width:` The number of architectures in the cla matrix
`mip[]:` A vector filled with MIP values
`miv[]:` A vector filled with MIV values
`cla[,]:` A matrix of the MIV value classifications for different architectures
`cla_name[]:` A vector of the names of the architecture classifications in the `cla[,]` matrix (`cla_name[0]` is used for unclassified voices).
`pri[]:` A vector of the MIDI Channel numbers in priority order
`n_ch:` Number of MIDI channels (16 for MIDI 1.0)

Outputs

`mute[]:` A vector of 16 Boolean values specifying whether to mute the corresponding MIDI Channel

Functions

`Vcc(cla)` Returns the complexity coefficient corresponding to the voice class

Temporary variables

`i:` index variable
`j:` index variable
`ch:` Channel number
`vo:` voice counter
`to:` total voice requirement

```
for i := 1 to n_ch do
  mute[i] := TRUE
end for

if mip_length != miv_length then
  for i := 1 to mip_length do
    ch := pri[i]
    if mip[i] <= polyphony then
      mute[ch] := FALSE
    end if
  end for
else
  for i := 1 to miv_length do
    ch := pri[i]
    to := 0
    vo := 0
    for j := 1 to cla_width do
      vo := vo + cla[i,j]
      to := to + cla[i,j] * Vcc[cla_name[j]]
    end for
    to := to + (miv[i] - vo) * Vcc[cla_name[0]]
    if to <= max_capacity then
      mute[ch] := FALSE
    end if
  end for
end if
```